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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/109,261	06/30/98	BAI	G 042390.P5769

MM92/0927
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EXAMINER

WARREN, M

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 09/27/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/109,261	Applicant(s) Bai	
	Examiner Matthew E. Warren	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2000.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some * c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☐ received in Application No. (Series Code / Serial Number) _____.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- | | |
|--|--|
| 15) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 18) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____. |
| 16) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 19) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 17) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. | 20) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

This Office Action is in response to the amendment filed on June 29, 2000.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 8, 9, 12, 13, 15, 16, 19, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Gardner et al. (US 5,963,810).

Gardner shows (fig. 3D) a semiconductor device having a multi-layered gate dielectric formed directly on the substrate. The first dielectric layer (303) of the gate dielectric is formed on the substrate. The first dielectric layer is silicon nitride (col. 5, lines 25-44). The second dielectric layer of the gate dielectric is a high dielectric constant material (305) of BST (col. 3, lines 15-43) and is formed on the first dielectric layer. The dielectric constant of the first dielectric layer (SiN) is less than the dielectric constant of the second dielectric layer (BST). A gate electrode (307a) is formed on the multi-layered gate dielectric.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10, 11, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner et al. (US 5,963,810) as applied to claims 8 and 15 above and further in view of Nagata et al. (US 4,015,281).

Gardner shows all of the elements of the claims except the for the formula to determine the dielectric thickness which Nagata discloses in column 4, starting at line 40. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the gate dielectric of Gardner by using the formula disclosed by Nagata to determine the appropriate thickness of a bi-layered gate dielectric.

Claims 14 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner et al. (US 5,963,810) as applied to claims 8 and 15 above, and further in view of Sato (US 5,258,645).

Gardner shows all of the elements of the claims except the third dielectric layer having a third dielectric constant. Sato discloses (col. 6, lines 49-58) a semiconductor device having a third insulating layer (12) formed as part of a tri-layered gate dielectric (17). The third layer (12) is silicon oxide and has a different dielectric constant than SiN and BST. The three layer gate dielectric is formed to optimize the threshold voltage of

the device and ultimately improve device characteristics (col. 4, lines 17-21). Therefore it would have been obvious to one of ordinary skill in the art to modify the bi-layer gate dielectric of Gardner by adding a third layer of dielectric material because Sata teaches that a triple layered gate dielectric optimizes the threshold voltage of a semiconductor and ultimately improves the device characteristics.

Response to Arguments

Applicant's arguments with respect to claims 8-21 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew E. Warren whose telephone number is (703) 305-0760. The examiner can normally be reached on Mon-Thurs, and alternating Fri, 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mahshid Saadat can be reached on (703) 308-4915. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

MEW

Mew

September 24, 2000

Mahshid Saadat

**Mahshid Saadat
Supervisory Patent Examiner
Technology Center 2800**